

NOTE.—The application for a Patent has become void.

This print shows the Specification as it became open to public inspection on 9 May, 1932, under Section 91 (4) (a) of the Acts.

# PATENT SPECIFICATION



Application Date: March 4, 1932. No. 6589/32.

402,739

Complete not Accepted.

## COMPLETE SPECIFICATION.

### Improvements in or relating to Gas Cocks.

We, FAURE PERE & FILS (SOCIÉTÉ A RESPONSABILITÉ LIMITÉE), of Revin, (Ardennes), France, a French Company, do hereby declare the nature of this invention and in what manner the same is to be performed, to be particularly described and ascertained in and by the following statement:—

The present invention relates to a gas cock for heaters, gas stoves and other appliances where the gas flow is regulated by means of the displacement of a cylindrical needle, or pin valve within a conical nozzle mounted at the extremity of said cock.

The Specification following here below will, on hand of the appended drawing which is given by way of example, fully explain the manner in which the invention may be carried into effect.

Figure 1 shows a section of the said cock.

Figures 2, 3 and 4 are sections through X—X of Figure 1 showing the cock in different working positions.

Figure 5 is a front view of the plug of the said cock.

Figure 6 shows a diagrammatic view of the assembled apparatus mounted in its place on the gas pipe or bracket.

The cock consists of the body *a* which forms the dome of the cock, of a hollowed out plug *b*, of a pin or needle *p* and of a nozzle *c* which is adapted to be screwed on to the extremity of the member *a*.

The said body of the cock is adapted to be mounted on to the gas supply pipe of the heater or stove by means of a threaded socket *m* the central channel *f* of which makes the connection between the gas supply pipe and the interior of the cock. The body or dome of the said cock, which has a conical bore *a* accommodates at its rear part, the plug *b* of the cock, at its middle part it acts as a guiding device for the pin or needle at *i* by means of a slide or slot wherein the pin *p*<sup>1</sup> which is integral with the pin or needle can

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freely slide. The front extremity *a*<sup>1</sup> of the body or dome *a* is provided with a screw thread into which the conical nozzle *c* of the needle valve may be screwed, the needle *p* of said valve being free to move up or down therein.

The hollow and conical plug of the cock *b* is provided at one of its extremities with a squared shoulder *b*<sup>1</sup> on which the knurled knob *q* is mounted, said knob allowing the plug to be rotated and thereby admitting or shutting off the flow of gas. An oblong opening or slit *b*<sup>2</sup> which is provided in the conical plug *b* on a level corresponding to that of the channel *f* of the body or dome of the cock, ensures a communication with the gas supply pipe by means of said channel *f*. This slot or slit is arranged in such a manner and at such a place, that it is only after the pin or needle has been pushed into the needle valve nozzle *c* a position which corresponds to the maximal reduction of the flow of gas through the valve nozzle *c*, that the passage *f* is closed by the dome of the cock. The interior of the cock is therefore in unrestricted communication with the gas supply, as soon as the needle is displaced in the valve nozzle *c*. In short there is no throttling of the gas as it arrives in the cock, and the opening thus attained in the bodies or domes of the cocks is of the type called "all or nothing".

The needle *b* of the needle valve consists of a rod cut off from the bar made of copper and of a cylindrical shape is guided on the one hand in the body *a* of the cock, at *i* by means of the pin *p*<sup>1</sup> which only allows it to effect longitudinal displacements, and prevents it from rotating or turning on itself, and on the other hand it is guided in the plug *b* by means of a cam or head piece *t*; this cam, cut in whistle shape rest against a pin or stop *v* fixed to the plug *b* and is acted upon by the pressure of the spring *z* the last turn or spiral of which rests on the trans-

versal member or internal rib  $i$  of the body  $a$ , said rib serving as a slide for the pin  $p^1$  of the needle.

The nozzle  $c$  of the needle valve which is provided with a screw thread on its outside, is mounted or screwed on the front extremity  $a^1$  of the gas cock; the nozzle has a central opening or hole with a cylindrical mouth  $c^1$  the opening then continuing towards the interior by a conical or tapered part  $c^2$ . The displacement or adjustment of the nozzle  $c$  on the socket  $a^1$  of the body  $a$ , allow the cross section of the passage at  $v$  for the gas to be varied for one and the same position of the needle  $p$ .

When the cock is open (i.e. in the position shown in Figures 1 and 2) the needle valve is at its highest position, (looking at Figure 1) and the gas flowing through the channel  $f$  passes through the slot or slit  $b^2$  in the plug  $b$  into the body of the cock  $a$  from which it emerges at a maximal quantity of flow through the passage  $v$  of the nozzle  $c$ . The flow of gas is regulated by turning the knurled knob  $q$  which movement moves the plug in the sense of the arrow shown in Figure 2, and in consequence of this movement the pin  $u$  moves, and as this pin is in contact with the acclivity of  $t^1$  of the cam  $t$  which forms the head of the needle or pin  $p$ , causes the latter to compress the spring  $x$ , and to enter the nozzle  $c$  to a greater or lesser amount, thus reducing the cross section of the outlet orifice for the gas when the needle or pin  $p$  has arrived at the end of its course, the plug is in the position shown in Figure 3 from which it is seen that the channel  $f$  is still in communication with the interior of the said gas cock.

By still further turning the knob  $q$  in the same direction (which direction is that shown in the arrows shown in Figures 2, 3 and 4) the plug closes the communicating duct  $f$  by the fact that a full part of the plug is now brought in front of the said channel such position being shown in Figure 4.

During this rotation (i.e. from the position shown in Figure 3 to that shown in Figure 4) the needle of the needle valve has remained stationary at its extreme position when it is fully pushed down into the nozzle opening; the stop pin  $v$  is then resting on the horizontal portion  $t^2$  of the cam  $t$  which forms the continuation to the inclined plane or acclivity  $t^1$ .

The cock being completely closed (position shown in Figure 4) it is easily understood that by turning the knurled knob  $q$  in the opposite direction, the plug in turning frees, or opens the orifice  $f$  before the needle or pin of the needle valve is moved

backwards, (that is to say upwards if one looks at Figure 1), by reason of the action of the spring  $x$  thus leaving the passage in the nozzle  $c$  free for the flow of gas. In fact, during the closure, it is only after the needle has been brought to its position which corresponds to the minimum flow of gas in the nozzle  $c$  or which even corresponds to a stopping of said flow, that the plug shuts the channel  $f$  absolutely off, so that no gas can pass through the cock and inversely, when the cock is being opened, it is only after the moment when the orifice of the gas supply channel has been completely opened, that the flow of gas can be regulated from a zero or minimum value to a maximum value, according to the extreme positions of the needle. In these conditions the interior of the gas cock is in free communication with the gas supply, whatever the adjustment to the gas discharge may be, and by reason of this fact, a constant pressure of the gas emerging from the nozzle  $c$  is ensured at any working conditions and at any consumption of gas; a fact which ensures a constant mixture of gas and air at the burner  $O$  (Figure 6).

It is of course understood that the device as above described may be modified without thereby going outside of the scope of the invention.

Having now particularly described and ascertained the nature of our said invention and in what manner the same is to be performed, we declare that what we claim is:—

1. A gas cock wherein the regulation of the discharge is obtained by means of the displacement of a cylindrical needle or pin within a conical nozzle, said cock being arranged in such a manner, that during the whole period of regulating the discharge, the interior of the body of the cock is in full and free communication with the gas supply pipe, the internal pressure in the cock being thus maintained constant, and that the gas admission starts only after the nozzle discharge has become a minimum or even zero, (the nozzle being in this case closed by the pin or needle) and vice versa, the opening of the communication between the interior of the cock and the gas supply takes place or is opened before the needle or pin opens the passage to the gas flow to the discharge nozzle.

2. Gas cock according to claim 1, characterised by the fact, that the plug of said cock is provided with a slit or slot corresponding to the gas supply channel provided in the body or dome of said cock, the said plug being provided in addition with a pin or stop projecting into the interior of said cock, and against

which a cam face is forced by reason of the action of a spring, said cam faced body forming the head of the valve needle or pin, the latter being suitably guided in such a manner as to prevent any other displacements except a longitudinal displacement which corresponds to the said pin or needle being pushed more or less into the conical or tapered portion of the gas outlet nozzle.

3. Gas cock as specified in claim 1, characterised by the fact, that the gas outlet nozzle can be screwed on to a greater or lesser extent to the extremity of the body of said gas cock, a feature which permits an adjustment of the limits of the regulation between a maximum and minimum outflow of gas, and which more particularly enables the nozzle to be completely closed by said needle or pin; when the latter is in the position permitting only a minimum outflow or discharge of gas.

4. Gas cock as specified in claim 1, characterised by the fact, that the orifice in the nozzle comprises a cylindrical portion which passes over into a conical portion.

5. Gas cock as specified in claim 1, characterised by the fact, that the needle

or pin of the needle valve is ensured at one of its extremities by means of a head, forming a cam which slides within a suitable bore provided in the plug, and is also guided at a suitable point along its length by means of a sliding device which is provided within a rib provided in the body of the cock, and in which a pin fixed to the said needle or pin is free to slide.

6. Gas cock as specified in claim 1, characterised by the fact, that the cam has an acclivity or inclined plane or slope, which passes over into a horizontal portion, the development of said horizontal portion being of sufficient extent to allow the plug of the cock to effect the rotational movement, required to open the inlet orifice admitting the gas into the gas cock, before the pin or needle is displaced by reason of the action of the spring to allow the gas to pass through the orifice of the needle valve outlet.

Dated this 4th day of March, 1932.

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Redhill: Printed for His Majesty's Stationery Office, by Love & Malcomson, Ltd.—1933.

*Fig. 1.*

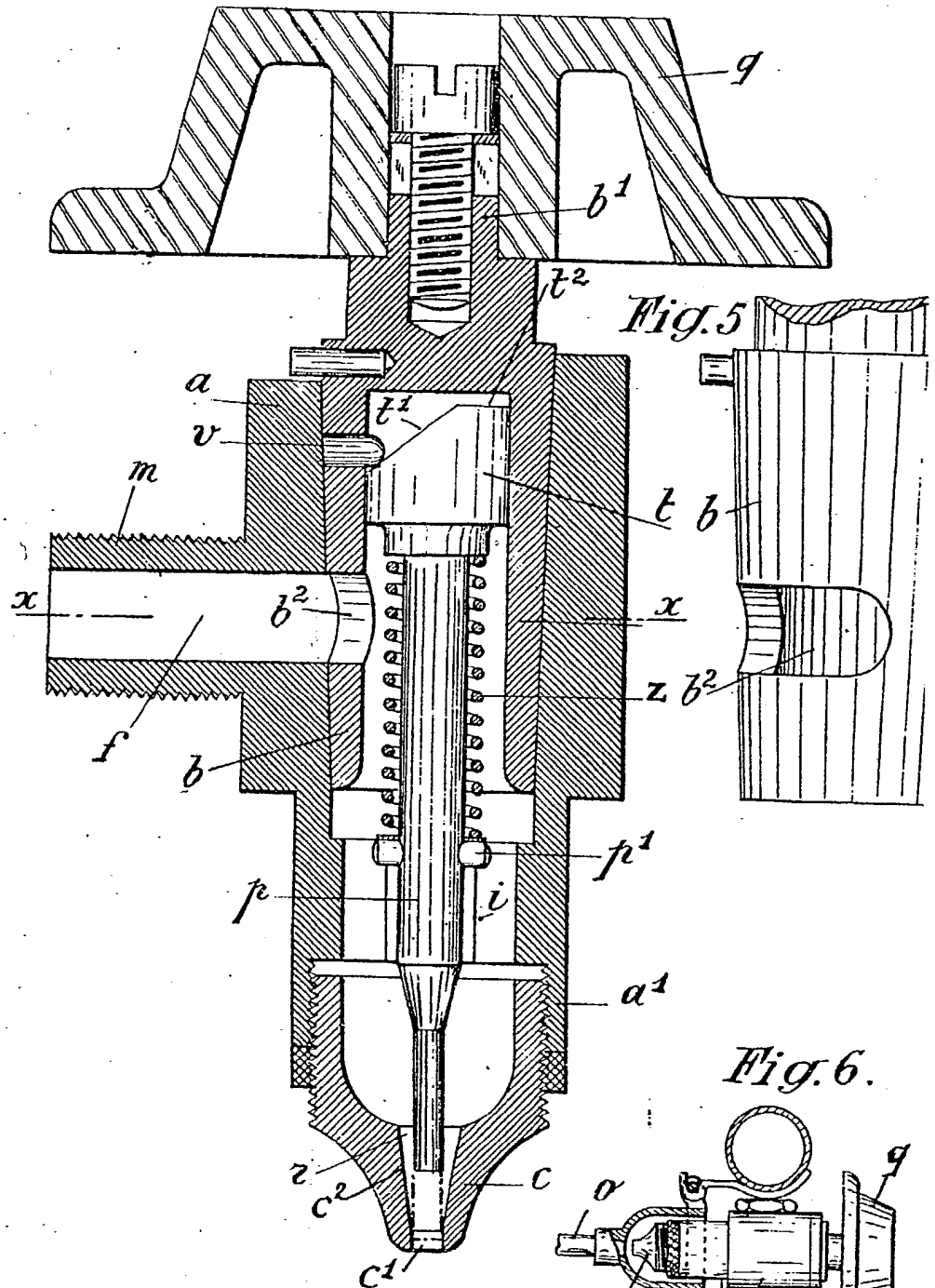


Fig. 2

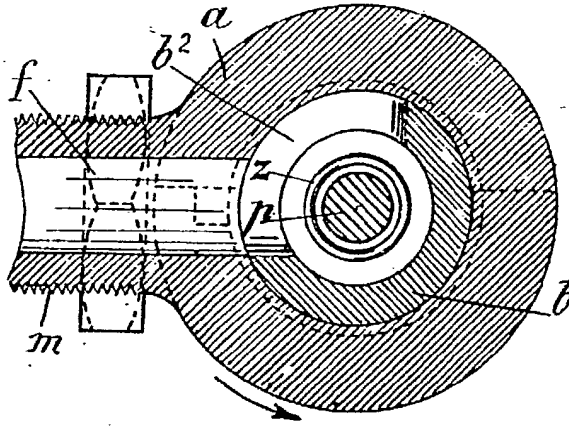


Fig. 3.

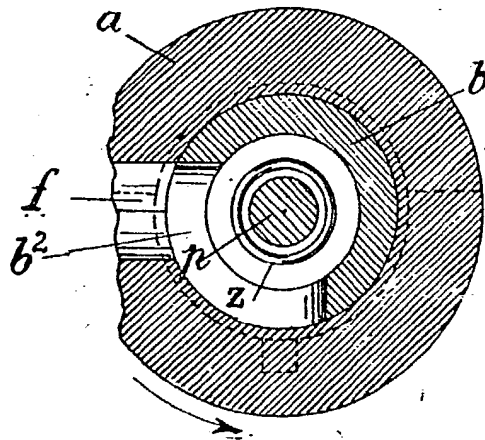
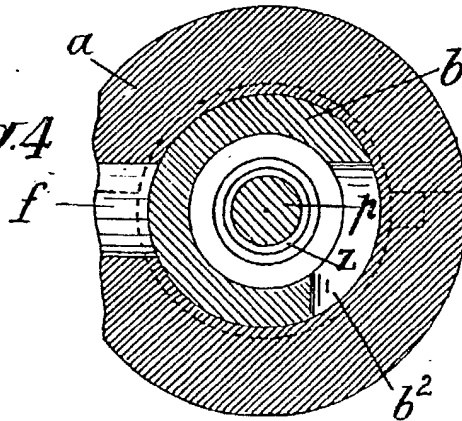


Fig. 4



Malby &amp; Sons, Photo-Litho

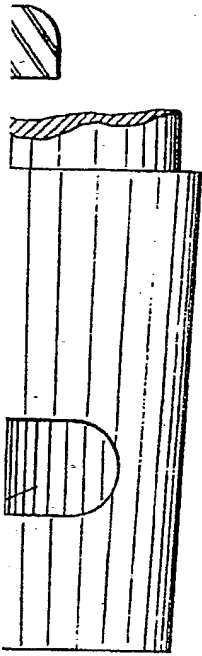


Fig. 6.

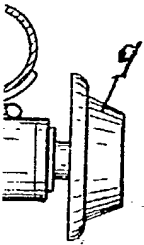


Fig. 1.

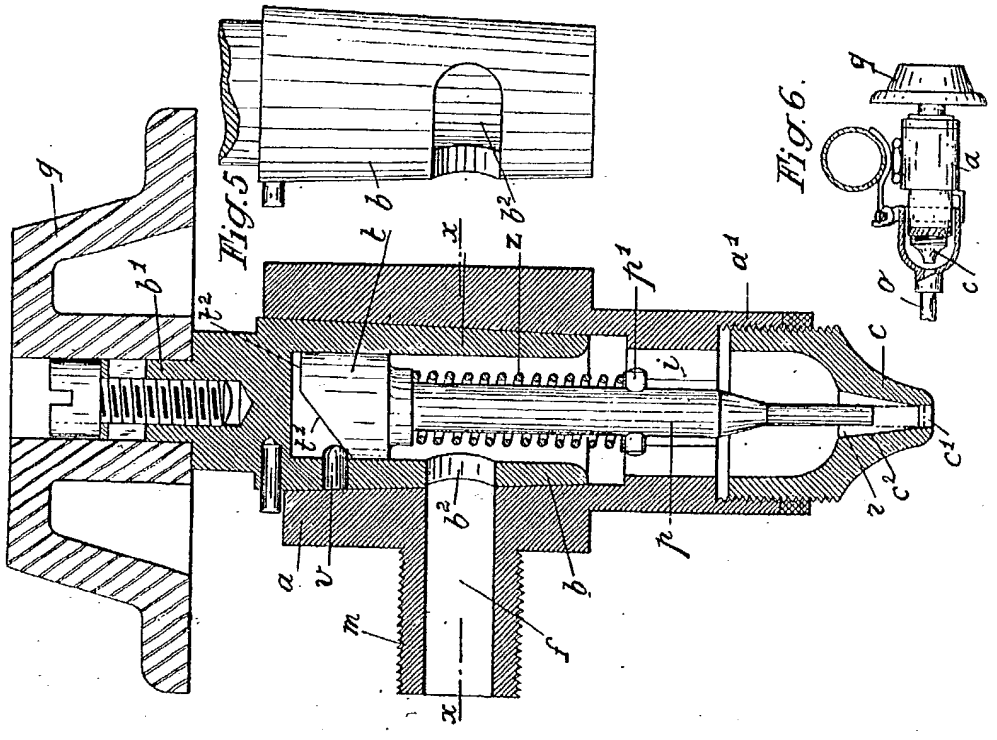


Fig. 5.

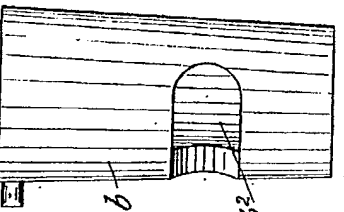


Fig. 6.

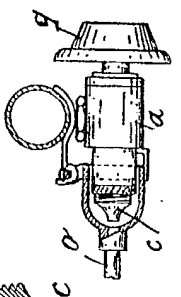


Fig. 2.

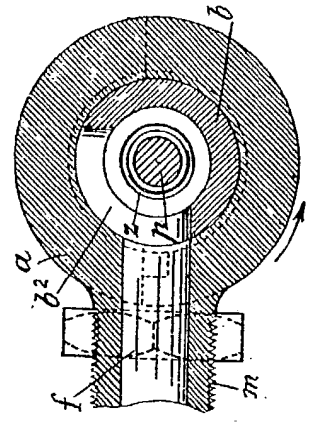


Fig. 3.

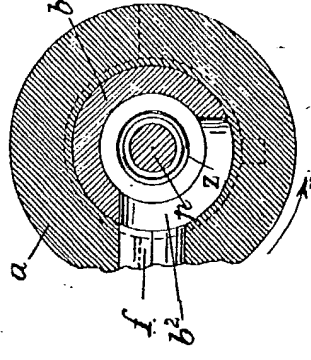


Fig. 4.

